

Interactive comment on “Spatial variation in soil active-layer geochemistry across hydrologic margins in polar desert ecosystems” by J. E. Barrett et al.

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How did the authors distinguished between sediments and soils? Was any description made of sediments/soils at the sampling sites? Was a trench opened perpendicular to the shore line to see the nature of the material? I realize that trenches of 11m should have been a bit labor intense, however, it is important to examine the material along the transect. Presences of textural discontinuities are affecting moisture movement. Fine material next to coarse ones could represent a barrier for moisture movement.. In terms of using the water content for biological activity, it is not the total water con-

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tent (at 105°C), but the available water. Five percent of water in a sandy soil is readily available, on the other hand, in clay soil is strongly held. Therefore, the texture is very important in water holding and water movement. Texture controls the dimension of the pores that in turns control water retention and movement including capillarity. Movement of nitrates and ammonium are conditioned by the charge of the ions- Nitrates are negatively charged and therefore are repelled by the soil particles that are also negative. The ammonium ion is positively charged and adsorbed by the soil particles .Phosphates .at pH of 8 and plus are insoluble. Talking about water, the authors should not ignore the Wu– unfrozen water in frozen soils. It was discovered in the soils of Antarctica by Ugolini and Anderson (Soil Sc. 115: 461-470, 1973). It forms thin films of interfacial water that allows ionic migrations. The experiment was conducted in a soil of the Wright Valley, the temperature of the soil remained at -20°C throughout the experiment. The paper is well written in spite of the results were somewhat predictable Nevertheless, it provides useful data also for other disciplines.

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